9-28-92

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 28 1992

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

MEMORANDUM

SUBJECT: Reregistration of Trifluralin. Sorghum grain processing study. CBRS No. 9991. DP Barcode No. D179068. MRID No. 42325001. Chemical No. 036101.

FROM: Bonnie Cropp-Kohlligian, Environmental Scientist
Reregistration Section II
Chemistry Branch II: Reregistration Support
Health Effects Division [H7509C]

THRU: E. Zager, Chief
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TO: Lois Rossi/Walter Waldrop [PM-71]
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Special Review and Reregistration Division [H7508W]

Attached is the review of data submitted by DowElanco and the Trifluralin Data Development Consortium in response to reregistration requirements for sorghum grain processing data. This information was reviewed by Acurex Corporation under supervision of CBRS, HED. The data assessment has undergone secondary review in the Branch and has been revised to reflect Branch policies.

It is recommended that a copy of this review be sent to the Registrant.

If you need additional input, please advise.

Attachment 1: Trifluralin CBRS No. 9991; DP Barcode D179068. Registrant's Response to Residue Chemistry Data Requirements.

cc: BLCKohlligian, Circulate, Trifluralin Reg. Std. File, SF, Update File, Acurex.
cc: RF (without attachment).

RDI: WHazel:9/23/92 MMetzger:9/23/92 EZager:9/25/92
H7509C:CBRS:BLCKohlligian:CM#2:Rm 803:703-305-7462:9/17/92.

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TRIFLURALIN
(Chemical Code 036101)
(CBRS No. 9991; DP Barcode D179068)

TASK 3

Registrant's Response to Residue Chemistry Data Requirements

August 26, 1992

Contract No. 68-DO-0142

Submitted to:

U.S. Environmental Protection Agency
Arlington, VA 22202

Submitted by:

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TRIFLURALIN

(Chemical Code 036101)

(CBRS No. 9991; DP Barcode D179068)

REGISTRANT'S RESPONSE TO RESIDUE CHEMISTRY REQUIREMENTS

Task 3

BACKGROUND

The Trifluralin Guidance Document dated 4/87 required data depicting trifluralin residues in flour and starch processed from sorghum grain bearing measurable weathered residues. This data gap was reiterated in the 10/91 Trifluralin Reregistration Standard Update. In addition, the Update requested data depicting residues in grain dust processed from sorghum grain bearing measurable weathered residues. In response, DowElanco and the Trifluralin Data Development Consortium submitted data (1992; MRID 42325001) from a sorghum processing study. This submission is reviewed here to determine its adequacy in fulfilling residue chemistry data requirements. The Conclusions and Recommendations stated in this review pertain only to the magnitude of trifluralin residues in processed sorghum commodities.

The nature of the residue in plants and animals is adequately understood. The residue of concern in both plants and animals is trifluralin per se. Adequate analytical methods are available for enforcing trifluralin tolerances in plants. These methods are listed in PAM, Vol. II (Sec 180.207) as Methods II, III, and B.

Tolerances for residues of trifluralin, α,α,α-trifluoro-2,6-dinitro-*N,N*-dipropyl-*p*-toluidine, in or on raw agricultural commodities are currently expressed in terms of trifluralin per se (40 CFR §180.207 and §185.5900). As there are no Codex MRLs for residues of trifluralin, there is no question with respect to Codex/U.S. tolerance compatibility.

CONCLUSIONS

1. The sorghum grain processing study is adequate. Trifluralin residues are not likely to concentrate in flour or starch processed from grain sorghum grown in soil that received a postemergence application of trifluralin. In addition, residues are unlikely to concentrate on the grain surface, as trifluralin is applied early in the growing season. Therefore, data pertaining to residues in grain dust are not required. No additional data are required for grain sorghum.

RECOMMENDATIONS

Note to SRRD: Separate tolerances should be established for each cereal grain commodity. Once tolerances have been established for each separate commodity, the listing for "Grain, crops (except fresh corn and rice grain)" should be deleted from the 40 CFR §180.207 entry.

DETAILED CONSIDERATIONS

Residue Analytical Methods

Trifluralin residues were determined using a GC method with electron capture detection (ECD), ABC Lab's Method TFN0291. This method is a modification of Eli Lily Method AM-AA-CA-RO23-AA755, which was previously described in the Trifluralin Residue Chemistry Chapter dated 7/85, and is a modification of Method II in PAM, Vol II. (Sec. 180.207).

In Method TFN0291, crop matrices (excluding oils) are extracted with methanol and filtered. The methanol extracts are then diluted with 5% NaCl, and residues are partitioned into methylene chloride and concentrated. Residues are reconstituted in hexane and cleaned- up using a Florisil column eluted with hexane. Residues in the Florisil-purified hexane fraction are dried, reconstituted in toluene, and then analyzed by GC-ECD. The detection limit for the method is 0.01 ppm for all sorghum matrices.

The registrant reported summary method validation data for wheat grain and flour from ABC Lab. Study No. 36598. Method recoveries were 84-95% from wheat grain and 78-131% from wheat flour fortified with trifluralin at 0.01, 0.05, and 0.1 ppm. In the present study, concurrent method recoveries from control samples fortified with trifluralin at 0.01 ppm were 112% from one grain sample, 83% from one flour sample, and 92% and 103% from two starch samples. Sample calculations and chromatograms were provided. These data indicate that method TFN0291 is adequate for collecting data on residues of trifluralin per se from sorghum grain, flour, and starch.

Storage Stability Data

After processing, control samples of sorghum grain, flour, and starch were fortified with trifluralin at 0.05 ppm and stored at -20 °C for 58-120 days until extraction and analysis. Recoveries of trifluralin from sorghum matrices after frozen storage are shown in Table 1. In addition, the 10/91 Update concluded that trifluralin is stable in corn grain for at least 192 days at -15 °C. The available storage stability data support the current residue data for sorghum grain matrices.

Table 1. Storage stability of trifluralin in samples of sorghum grain, flour, and starch fortified with trifluralin at 0.05 ppm and stored at -20 °C.

Matrix	Storage Interval (days)	Residues (ppm)[a]	Percent Recovery
Grain	114	0.056	113
Flour	58	0.055	110
Starch	58	0.049	98
	120	0.042	83

[a]Not corrected for concurrent method recovery.

Magnitude of the Residue

Sorghum Processed Commodities. A tolerance of 0.05 ppm has been established for residues of trifluralin per se in or on cereal grains (excluding fresh corn and rice grain) 40 CFR §180.207. Trifluralin is currently registered on grain sorghum for a single postemergence application incorporated into the soil. The maximum-recommended use rate depends on soil type and is 0.5 lb ai/A for course textured soils, 0.75 lb ai/A for medium textured soils, and 1 lb ai/A for fine textured soils. Trifluralin is applied early in the growing season as an over-the-top or directed spray that is incorporated into the soil when plants are at least 8 inches in height. No PHI is listed for grain sorghum.

DowElanco and the Trifluralin Data Development Consortium submitted data (1992; MRID 42325001) depicting trifluralin residues in or on sorghum grain and in sorghum flour and starch. In a test conducted in MO, trifluralin (4 lb ai/gal EC) was applied at 3.75 lb ai/A as a directed, post-emergence, soil application 19 days after planting. The trifluralin was immediately incorporated into the soil, which was classified as a silty clay loam (medium/fine texture). The registrant characterized the application rate as being 5x the recommended label rate; however, because the maximum label rate is 1 lb ai/A, CBRS considers the rate applied to be 3.8x the maximum label rate.

The test plot was harvested at 108 days posttreatment and samples of grain were immediately frozen. Prior to processing, grain samples were stored at approximately -20 °C for 68-74 days. Grain samples were dry-milled and wet-milled using simulated commercial practices to yield flour and starch, respectively. The yield in lbs of flour and starch was 29-31% and 49-53%, respectively, of the grain samples processed. These yields translate into theoretical concentration factors of 4x and 2x for flour and starch, respectively. After processing, samples of grain, flour, and starch were stored at -20 °C for 113-119 days until extraction and analysis. The total storage interval for whole grain samples was 187 days.

A single control and treated sample of each commodity was analyzed for trifluralin residues using Method TFN0291. Apparent residues of trifluralin in or on control samples of grain, flour, and starch were nondetectable (<0.01 ppm). Trifluralin residues were nondetectable (<0.01 ppm) in or on grain harvested from sorghum grown in soil that was treated post-emergence with trifluralin at 3.75 lb ai/A (3.8x). Trifluralin residues were also nondetectable in flour and starch processed from the treated grain.

Although the registrant did not apply trifluralin at 5x the maximum label rate, the application rate (3.8x) is greater than or approximately equal to the maximum theoretical concentration factor for flour (4x) and starch (2x) determined in this study. Therefore, these data adequately depict the potential for concentration of trifluralin residues in sorghum flour and starch. Residues of trifluralin per se are not likely to concentrate in either flour or starch processed from grain sorghum grown in soil receiving a post-emergence application of trifluralin. In addition, residues are unlikely to concentrate on the grain surface, as trifluralin is applied postemergence to the soil early in the growing season. Therefore, data pertaining to residues in grain dust are not required.

References

Citations for the MRID documents referenced in this review are presented below. Submissions reviewed in this document are indicated by shaded type.

42325001 Rice, F.; Gresham, M.E. (1992) Magnitude of the Trifluralin Residues in Grain Sorghum Processed Commodities: Report No. 38640. Unpublished study prepared by ABC Laboratories Inc. 147 p.